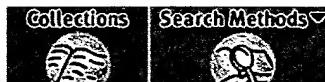



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## Re-evaluating business processes: Meeting the challenge of the new digital economy

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**Abstract:**

*Dramatic economic and technological developments are forcing companies to rethink the way they do business. Among the major factors affecting businesses today are a high level of mergers and acquisitions, continued globalization, and an increasingly sophisticated customer base. All of these trends are affected in a significant way by the advent of the Internet. Several opportunities arise for imaging service bureaus as a result of these trends.*

**Full Text:**

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Dramatic economic and technological developments are forcing companies to rethink the way they do business or face the prospect of losing their place in the market. Among the major factors affecting businesses today are a high level of mergers and acquisitions, continued globalization, and an increasingly sophisticated customer base.

Manpower constraints are resulting in pressure to move resources from transaction processing to knowledge work, and to outsource tasks previously carried out within the firm such as document imaging services.

These tasks are carried out by individuals who are independent and mobile. Virtual corporations have emerged as a preferred approach to accomplished many of these outsourced tasks. Another significant trend is centralization, which has regained favor after the lack of control inherent in decentralization became evident. Finally, the Y2K crisis is diverting resources away from productive, incomeproducing activities and compelling companies to either simplify or outsource some of their IT initiatives.

These trends, though diverse, have something in common. All of them are affected in a significant way by the advent of the Internet. The Internet poses many challenges and presents many opportunities for today's companies.

Automated transaction processing, for example, can now be done in a "lights out" mode that can improve productivity just as automation in manufacturing processes improved productivity in that realm.

By capturing the information related to these transactions in digital form, businesses can market as never before, tailoring products and services to the individual purchaser. Every company not using the Internet as an integral part of its business processes should take a careful look at this technology and the ways in which it can be used to leverage the intellectual capital on which future success will depend.

Several opportunities arise for imaging service bureaus as a result of these trends. Many companies will follow the path of outsourcing and will use service bureaus in order to maintain a focus on their core competencies, whatever those may be. A significant backlog of paper-based information remains to be digitized, providing a continued demand for imaging and OCR services. Over the long term, however, imaging service bureaus will need to reconsider their role in the information business.

As more information is initially created in digital format, the demand for imaging may decline. Because service bureaus have extensive experience in digital asset management, they are in an ideal position to facilitate companies' transitions from paper-based transactions to those based on digital information. Although this has not been their traditional role, imaging service bureaus may find that they can best serve their customers by helping them move into an increasingly digital and Internet-centric world. To do so, they will need to increase their understanding of business processes, or partner with companies that have expertise in this area.

#### The New Corporate Asset: Intellectual Capital

Businesses in all sectors are under everincreasing pressure to respond to change in today's world, and in many cases it is time for them to sit back and rethink their processes in a very fundamental way. In large part because of the Internet, past assumptions about how business should be done are no longer valid.

The Internet offers an entirely new set of options for marketing, transaction processing, and customer service. Many new opportunities lie ahead, but in order to capitalize on them, companies must understand how electronic business works, and why the old approaches are inadequate for new challenges.

The old assets were facilities, equipment, and financial holdings. The new asset is intellectual capital: people, knowledge, business processes, and relationships. Intellectual capital must be managed with as much attention as was previously directed toward a company's buildings and bank accounts. It should also be leveraged in the same way, to optimize use of this resource.

In order to make room for more valueadded activities that will keep them ahead of the competition, service companies need to automate their business processes just as manufacturers automated their production processes over the past few decades. Those manufacturing firms that successfully streamlined their production and "worked smarter" went on to succeed, while those that failed to do so are no longer in the market.

#### Key Business Trends

When companies first look at their information management processes, it is easy to start making lists of equipment and technology to buy and install. Everyone wants "the solution," and wants it to be implemented quickly and painlessly. But before any true solution can be identified, the context in which it will be used, both within the enterprise and in the larger business community, must be understood.

If information management and knowledge management are not made compatible with forces operating in the economy at large and within the enterprise, they will not be effective. Stepping back for a moment and looking at the major forces that are shaping the world marketplace, we can see some key trends that should influence the way companies devise their business processes.

Mergers and acquisitions proliferate. One of the most notable business trends of the past decade has been the high level acquisitions and mergers. The financial services sector is a prime example, but there are many others, including the imaging service bureau industry itself, particularly over the past 5 years. Companies are seeking greater revenues and the efficiencies that can come from largerscale operations. Moreover, companies must offer a broader range of products and services in order to stay competitive.

Acquisitions and mergers are a faster way to achieve both size and breadth than growth from within the firm, which would require developing new products and services in-house. Yet this growth activity mandates frequent changes in a company's overall business processes and information management.

#### Globalization flourishes

Over the past decade we have seen an unprecedented level of globalization of businesses. Large companies market worldwide, and even small companies often have branches overseas. A company might conduct its R&D in one country and have manufacturing operations in another. Or, it might be headquartered on one country but have its major markets in another part of the world. This trend was already going strong because of worldwide economic

forces, but clearly it has been fostered by the development of the Internet and the ability of companies to reach beyond their geographical boundaries to both customers and employees overseas.

Sophisticated customers demand customized service.

Customers are becoming very knowledgeable about their options and far more demanding than in the past. In just a few minutes of on-line research, consumers and corporate purchasers alike can access a wealth of information about the product in which they are interested. More than 40% of people making major purchases use the Web to access information about potential purchases.

Customers are no longer satisfied with a mass marketing approach from vendors, either. They want the product quickly, but they also want it "their way," tailored to their specifications. Because of the Internet, customers can shop the world from their desktops. Services such as Opriceline.com, for example, which allows travelers to name a ticket price, have reversed the usual flow of information. And suppliers at every level (not just the retailer) need to be a part of the process, passing along information on product availability right away. Otherwise, the customer can all too easily turn to another vendor.

Virtual corporations emerge.

The Internet has broken down many of the barriers to entry into a business. No longer does an organization need a national sales force or physical offices to have a national presence. For example, on-line bookseller amazon.com did not build even one retail outlet or hire a single store manager. Yet this upstart is successfully challenging well-established firms in book retailing. A web-based business can make its presence felt overnight, literally. From its vantage point on the Web, a newly established, one-person firm can have the same look as a multimillion dollar corporation.

Other forms of virtual corporation are also emerging. Small organizations team up for a project, disband, and form new alliances for the next project. Large companies outsource specialized work, and the client may never know. Boundaries between companies have become much more fluid. The Internet provides the connectivity that allows these flexible arrangements. Manpower

constraints affect corporate strategies. The United States economy is now close to full employment, despite a decade of downsizing. With the supply of human resources constrained, companies are automating lower-level activities, moving employees from transaction-centric work to knowledge work and the areas where the firm can really add value. Some organizations respond to the shortage by outsourcing work to those companies that have managed to attract the necessary human resources, and others contract out directly to independent consultants. The shortage is exacerbated by the decline of the number of workers, which is correlated with the winding down of the baby boom era. The labor shortage may also foster additional use of offshore workers.

Specialty skills develop and workers become mobile.

Many workers have become independent and mobile, providing a set of specialized skills to firms that need them. Some have chosen this route in order to control their own work environment or maintain a flexible, family-friendly lifestyle. Others have been thrown into it by the new work environment, which no longer offers the option of a lifetime job, or, in many cases, even a long-term job. The key word here is change.

As the market changes, so do corporate requirements for employees. Just as companies are seeking new products via acquisition rather than through internal growth, they often are seeking new skill sets from workers who already have them rather than through training in-house staff.

Centralization is back.

After several years of moving toward decentralization, companies are now moving back toward centralization. One important reason is that organizations have become increasingly aware that information is a key corporate asset. If all the information goes out the door at 5 p.m. on a laptop, the company does not retain this most valuable asset.

Moreover, access to this information can be controlled only if it is managed centrally. Because on-line analytical processing (OLAP) and data mining software often require analysis of information across departments, this data must be coordinated enterprise-wide.

The present trend is toward centralized control and distributed access, which offers the best of both worlds. Companies need to manage their information assets the same way they would facilities and cash, and this requires a

higher level of control than is possible in a decentralized environment.

Y2K consumes resources.

The year 2000 issue has become a major drain on human and financial resources in both the public and private sectors. These resources are being expended not to improve productivity or expand markets, but to prevent disaster at the turn of the century.

Numerous published articles indicate that the Y2K problem is far from resolved, and we may not know until the clock strikes midnight exactly how serious this problem is. In the meantime, nearly every business is addressing this, and it is costing them time and resources. As a result, they are having to adapt in one way or another, either by outsourcing the Y2K problem, or by simplifying, partnering, or outsourcing some of their other information management requirements.

### **The Shifting Balance: From Transactions to Analysis**

Once the broad trends in industry, many of which are supported by the Internet, are factored in to the picture, we can begin to look at how companies can improve their processes. The people, knowledge, business processes, and relationships of a company constitute its intellectual capital. In order to compete effectively, that company will need to use all of its resources at an optimal level. There is less and less room for sub-optimal performance. Yet ironically, firms that track their budgets to the penny may spend thousands of dollars correcting faulty decisions based on inadequate information, or simply looking for misplaced information.

Right now, many service companies are still spending the majority of their time on transaction processing, but this balance must shift for those companies that seek to be world-class performers. The majority of time in the future will need to be spent on high-value activities such as planning, analysis, and customer service. In 1996, an estimated 70% of corporate resources were spent on transaction control and processing, with the remaining 30% spent on planning and analysis.

By the year 2000, this balance is expected to nearly reverse for the more competitive firms, so that only 40% is spent on transaction processing and 60% is spent on planning and analysis. The firms that achieve this ratio will have a 4-8% revenue advantage over their competitors.

In essence, world-class enterprises will be spending less time completing a sale and more time thinking about it-planning, analyzing, and managing it. Those that are still using the "brute force" approach to transaction processing will find they cannot compete. They will not have the information they need to predict customer preferences, nor the ability to respond to those demands as quickly as their competitors.

### **Optimizing Business Processes**

How are all these forces interacting to shape emerging business processes?

Manufacturers in the United States companies have successfully competed in many cases with companies overseas that use low cost labor by automating their production processes. The same thing can be done with other types of businesses. In manufacturing, raw material is converted to products through automationwelding robots, painting robots, and many other steps.

This approach allowed U.S. manufacturers to streamline production, focus on enhancing such activities as customer relations and developing new business, and once again take the lead worldwide. A recent study showed that today, 75% of value added in manufacturing is through intellectual capital rather than through the production process itself.

Outside of manufacturing, in retailing and service organizations, many transactionbased activities traditionally carried out by people are being automated. The same way that mechanical robots allowed a production line to move forward with minimal human attention, information technology allows the entire transaction process to be completed in an automated fashion.

Human resources can then be redirected to higher-level activities to improve the quality of products and services, enhance customer relations, and develop new markets. Customer relations and marketing have always been a part of business, of course. However, it was the radical change to web-based purchasing that permanently changed the landscape.

In today's world, a customer considering a purchase often uses the Web as an information resource, an approach

virtually unheard of five years ago. After locating a relevant Web site through a search, the customer may then select the product and place an order. The order then goes through a series of approvals, which also can be done in an automated fashion.

After the purchaser's credit is checked electronically, the order is processed. Robots in the warehouse locates the product, package it, weigh it, and route it for mailing. The entire flow is managed electronically, and the information moves through the organization. The goal is a lights-out operation in all the transaction processing.

Capturing the order digitally via the purchaser is a key part of this business process. First, it eliminates the need for sales clerk. For example, at [amazon.com](http://amazon.com), who does all the data entry? The customer. Digital data capture is the first ingredient for a lights-out system of transaction processing. The goal is to capture the data either from the customer or as soon as it comes into the work environment.

At that customer interface, the vendor must provide good information and a positive, customized buying experience. Once the on-line purchase is made, the digitized information is immediately available. Now the demand chain, in addition to the supply chain, can be managed.

With an electronic link to the customer established, vendors can find out what the customer wants, rather than saying, "Here is what we are selling. Do you want to buy it?" This information is vital to the next part of the process, which is customized marketing. The data can be analyzed to support proactive, targeted marketing directed at customers. Once a customer has expressed an interest in a certain area, follow-up offers can be sent by e-mail.

For example, a customer who has just bought a computer is a good candidate for software. A new homeowner may need furniture, garden equipment, and replacement windows. Targeted marketing is well established; follow-up marketing by regular mail has long been carried out by vendors in every arena.

The difference is the speed of response—a day rather than weeks to arrange a mailing—and the precision allowed by being able to analyze the data. In some market tests in Europe by developers of customized catalogs, there were cases where the response rate was as high as 90%, versus single digit responses for traditional catalogs.

Information services that sell data for a fee are in a good position to determine customer preferences and market high-probability items as well.

Having a digital record also facilitates trouble-shooting in orders. For example, if an "out of tolerance" situation develops, such as an errors in an order, the digitized information provides a very efficient way of mediating. Information on every aspect of the order is readily available, and it is relatively easy (compared to reconciling discrepancies that occur in paper-based orders) to identify the steps needed to resolve the transaction. This interaction is not yet real-time but is near-time and uses intelligent agents to move the information to an individual who is resolving the problem. Cycle times on problem resolution can easily be orders of magnitude less than with paperbased systems.

On the back end, order information can be delivered to partners as part of the supply chain information. Suppliers can then readily find out what products are moving out of inventory and what the product flow will need to be. Similarly, managers in service organizations can find out where the bottlenecks are in terms of transaction flow, what services are most profitable, or explore any other questions through OLAP and data mining.

An executive in a firm may want only top level information every morning about the company's performance—note the company's aggregate sales, take a quick look at yesterday's stock price, check on the competition, and find out how many staff positions are waiting to be filled.

A product developer may want to track individual product sales and the level of customer complaints. Colleagues may need to work in a collaborative environment supported by communication and analytical tools. Clearly, all of this activity hinges on having well-organized, easily accessible digital data.

In most organizations, an immense amount of time is spent on correcting mistakes. These mistakes can range from incorrect order fulfillment to mis-filing documents or making erroneous decisions based on inadequate information. The first line of defense is to eliminate the mistakes by having a good information system. The second line is to reduce the amount of time required to correct the mistake, and this too hinges on a good information system.

#### Implications for Decision-Makers

How do the major trends interact with each other and with the new business processes to create a new business environment? It is a complex network of forces, and the way they interact is also complex. Take the relationship

between two of the trends: mobile workers and centralization of information. Use of mobile workers actually mandates the need for a corporate data store, in order to assure that a company supported by mobile workers maintains its intellectual capital

And yet it is also the centralization, the presence of a stable base of information, that allows a company to make effective use of mobile workers. Corporate memory is moving from humans to the enterprise itself. But it is not a simple process, and the degree to which each trend will remain strong is not yet clear

For example, the temporary use of specialized knowledge workers can be very productive and cost-effective. But what happens when an expert starts working temporarily for the competition? This situation is similar to one in which an employee moves to another company, yet the frequency of transition is likely to be much higher.

An estimated 70-80% of industrial espionage occurs from within, and companies will have an increasing number of people moving through the firm and having access to key information. In the long run, companies may find it more efficient and more secure to hire employees, and reciprocal loyalty between worker and company may experience a renaissance.

The trend toward mergers and acquisitions clearly is impacted by having an automated process in place that can absorb the new resources. A service company in the process of growing through acquisition of similar businesses can much more readily incorporate the new entities if a stable, universally accessible information system has been established. More and more, the analytical tools are platform independent, allowing easier integration of new information. Moreover, the warehousing tools are becoming more powerful, and again, these can support more rapid and efficient integration of the information contained in newly purchased businesses.

The biggest inhibitor of improved business processes is paper-based transactions. Between 80% and 90% of corporate information remains in hard copy form, and none of the activities described above are attainable nearly as well, or in some cases at all, as with digital data. A well-designed information system with efficient data capture, adequate data storage, and effective data analysis seems like an obvious solution, but is often a concept rather than a reality.

The reality is that many enterprises have islands of automation but few have an integrated information system. In a business environment where 84% of IT executives have been given the mandate of delivery of universal data access and 75% of them have concerns about how to do so, the challenge is clear.

First, businesses should examine carefully the balance between their transactional and their analytical activity. If they are spending more than half their time on transactions, they are in for a rough ride. Their more successful competitors will be automating those transactions and will have time to learn more about their customers, evaluate product acceptance, and then develop enhanced products. Second, they should become familiar with the available tools. These tools, ranging from intranets to extranets and OLAP software, provide significant leverage and sometimes dramatic ROI for the companies that use them.

On a broader scale, companies should take steps to ensure that the technology is truly being integrated into the business process as the process should function (not as it is presently functioning). One of the reasons that companies experience productivity increases of only 1-2% after purchasing computer technology is that it is not being effectively incorporated into an optimal business process. Instead, computer technology is being used as an overlay to existing processes.

To be most effective, an information system needs to integrate the most appropriate technology with the optimal business processes, but efforts to do so can produce a clash of cultures. Enthusiastic information technologists may lack an understanding of the process side, and the business specialists may not appreciate the capabilities and limitations of the technology.

Ideally, the process should be redesigned from scratch, building in from the beginning the advantages of a digitized system, with input from both information technologists and business specialists. Finally, any system put in place today should be programmed for change-designed to be flexible and to grow with the business.

In many cases, companies are struggling to just keep up with the work flow on a daily basis, and it can be difficult to set aside the time and resources to consider major innovations. But for those firms that do give this task the time and effort it deserves, despite the short-term disruption that ensues, the long-term prognosis is good. Continuous innovation should be an integral, ongoing part of doing business, and a critical evaluation of processes is a vital first step.

Imaging service bureaus should be aware of the changing business processes of their customers. Those service bureaus that have an understanding of important business trends will be in a much better position to thrive than the ones that assume that the imaging business will remain static into the next century. Those service bureaus that are able to help companies evaluate their processes and make the transition to an effective digital system will clearly have an edge.

#### About the Author

President and CEO of Work Smart (a division of [@Anacomp](#)), Tom Magazzine, has an extensive background in the document imaging industry. Work Smart was launched in 1996 and is a professional services company that focuses on content management in enterprise netcentric environments.

With more than 25 years of experience in information management, his career includes 19 years with the Business Products Division of [@Xerox Corporation](#), where he was responsible for commercial corporate accounts and federal operations.

Tom is a frequent speaker at many conferences including COMDEX/Windows World, Federal Imaging, and AIIM, and he has also received many awards for achievement such as the Gold Medal-New Media\Invision Multimedia Award, KPMG High Tech Entrepreneur Award and the Smithsonian Award for Visionary Use of Information Technology. Currently Chairman of the AIIM's Emerging Technology Group, and is listed in the Who's Who of Worldwide Technology, Tom was recently awarded the prestigious Master of Information Technologies by AIIM International. He also is a member of the Society for Enterprise Engineering. He holds a B.A. from Kent State University and an M.B.A. from Akron State University.

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